REMARKS/ARGUMENTS

Claims 1-68 were pending. Claims 57-68 are cancelled without prejudice to future prosecution in this or another application. New claims 69-76 are added and are supported in the specification at, *inter alia,* pages 3, 27 and 74, and sections 4.2.3 to 4.2.4. Applicants elect Group I for examination, with traverse. New claims 69-74 and 76 depend from claim 1 and are included in the elected group. New claim 75 is based on claim 1 and is also included in the elected group.

Traverse

All of claims 1-68 have been searched by the present Examiner during her examination of the the same claim set in PCT/US03/30940. Only three references were cited as art references: Wingfield et al. (X), WO 93/13663 (Y) and WO 01/02001 (Y). These references are discussed below and shown not to relate to the claimed invention. Insomuch as the claims of Group 1 and all other groups have been searched, Applicants respectfully submit that the burden on the Office for examining the pending claims is small, while the burden on the Applicant to file fifteen divisional applications would be great. Applicants further note that the pending claims are fully supported in the application. Wingfield is of record, having been cited by the Office. Copies of the International Search Report and other references are submitted in the accompanying Information Disclosure Statement.

Wingfield et al.

According to the Office (Office Action pages 3-4) the invention of claim 1 is allegedly anticipated by Wingfield et al., 1997, *Protein Science* 1653-60. Specifically, the Office asserts that claim 1 is directed to "a synthetic gene corresponding to a naturally occurring gene encoding a polypeptide segment wherein said synthetic gene is less than 90% identical to the naturally occurring gene." As explained below, this is an incorrect paraphrase of the actual invention claimed. When the actual claim language is reviewed, it is apparent that the Wingfield reference is wholly unrelated to the present invention.

According to the Office, the Wingfield et al. reference taught a gene that is gene fragment of gp41. The Office alleges that the Wingfield et al. fragment is less than 90% identical to a naturally occurring counterpart because it is missing the N-terminal 26 residues and contains mutations at residues 86 and 92. For the sake of this response only, Applicants will assume the Office's characterization of Wingfield et al. is correct. Applicants note that the Wingfield et al. gp1 gene is produced by conventional recombinant methods unlike the new methods disclosed by the Applicants.

Based on its reading of claim 1 and of the Wingfield et al. reference, the Office concludes that Wingfied et al. describes:

(1) ISA's Incorrect Version of Claim 1	(2) Teaching of Wingfield et al. asserted by the ISA to anticipate (1)
a synthetic gene	(A) DNA encoding residues 27-149 of the transmembrane glycoprotein gp41 from SIVmac239 containing two non-naturally occurring mutations
corresponding to a naturally occuring gene	(B) DNA encoding residues 1-149 of the transmembrane glycoprotein gp41 from SIVmac239
encoding a polypeptide segment	Residues 1-149 without mutations
wherein said synthetic gene is less than 90% identical to the naturally occurring gene.	The Office states "the gene taught Wingfield is less than 90% identical to the naturally occurring gene because it is missing [the nucleotide sequence encoding] the N-terminal 26 residues."

As noted above, the characterization of claim by the Office is incorrect and omits important elements of the claim. As a consequence, the ISA's conclusion that claim 1 lacks a special technical feature is incorrect.

Claim 1 is directed to: "A synthetic gene encoding a polypeptide segment that corresponds to a reference polypeptide segment encoded by a naturally occurring gene, wherein the polypeptide segment-encoding sequence of the synthetic gene is different from the polypeptide segment-encoding sequence of said naturally occurring gene, wherein a) said polypeptide segment-encoding sequence of said synthetic gene is less than about 90% identical to said polypeptide segment-encoding sequence of said naturally occurring gene . . . ". This claim is quite different from that analyzed by the Office and omits the concept of correspondence of the polypeptide segments (see underlined language). Analyzed properly, the Winfield et al. reference described a polypeptide segment corresponding to residues 27-154 of gp41 of SIVmac 239 with two mutations relative to the naturally occurring polypeptide segment. Residues 27-154 of gp41 of SIVmac 239 are a polypeptide segment. The SIVmac 239 polypeptide segment corresponds to the 127-residue polypeptide segment of the naturally occurring gene and differs from same at two residues. As shown below, the so-called synthetic gene described by Winfield et al. is >98% identical to the corresponding naturally occurring segment.

A synthetic gene	*DNA encoding:
encoding a **polypeptide segment**	residues 27-149 of the transmembrane glycoprotein gp41 from SIVmac239 containing two non-naturally occurring mutations
that corresponds to a reference **polypeptide segment** encoded by a naturally occurring gene,	residues 27-149 of the transmembrane glycoprotein gp41 from SIVmac239

wherein the polypeptide segment-encoding sequence of the synthetic gene is different from the polypeptide segment-encoding sequence of said naturally occurring gene, wherein	the DNA encoding the version with two mutations differs from the "naturally occurring" sequence because it encodes different residues at two sites, C86A and C92A. The reference does not provide the mutated DNA sequence.
said polypeptide segment-encoding sequence of said synthetic gene is less than about 90% identical to said polypeptide segment-encoding sequence of said naturally occurring gene . . .	The 366 nucleotide DNA sequence encoding residues 27-149 without mutations differs from a DNA sequence mutated at C86A, C92A by 4-6 bases.** Thus the mutated sequence is 98.4-98.9% identical to the naturally occurring gene.

* Applicants do not consider the Wingfield gene to be synthetic, but assume it is for purposes of this discussion.

**Applicants do not know exactly how the DNA sequence was changed to encode the variant codons.

Applicants submit it is clear that the Wingfield et al. reference is not anticipatory.

WO 93/13663 (Katz; Abbott Laboratories)

WO 93/13663 (hereinafter "Katz") was listed as a "Y" reference by the International Searching Authority (the present examiner) relevant to claims 1-15, 22-23 and 51-58. Katz described a method of directing biosynthesis of specific polyketides. The method involves isolating a polyketide biosynthetic gene (i.e., a gene that encodes a protein involved in polyketide biosynthesis) from a microorganism. See abstract. The gene may be modified using conventional molecular biology methodology. See pages 9-12 of the Katz publication. Nothing in Katz suggested a *synthetic gene* having the properties of the polynucleotide of instant claim 1. Rather, any given polypeptide segment-encoding sequence in the recombinant gene of Katz has nearly exact correspondence polypeptide segment-encoding sequence of the naturally occurring gene from which it is directly derived. WO 93/13663 is not relevant to the present invention.

WO 01/92991 (Khosla; Kosan Biosciences)

WO 01/92991 (hereinafter "Khosla") was listed as a "Y" reference by the International Searching Authority (the present examiner) relevant to claims 1, 14 and 15. The Khosla reference provides a method and algorithm for designing recombinant polyketide synthase (PKS) genes that produce a desired polyketide compound. The recombinant genes are made by combining modules, portions of modules or sets of modules from individual known PKS genes. Although the recombinant genes are chimeric, the synthetic genes of the present invention were not described. WO 93/13663 is not relevant to the present invention.

Conclusion

For the reasons provided above, Applicants respectfully request that the claims now pending be examined and a Notice of Allowance issued.

Related applications

Applicants wish to advise the Examiner of the following copending, commonly assigned, U.S. patent application directed to similar subject matter: U.S. Patent Application No. 10/820,975 for "Synthetic Genes" filed April 7, 2004.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

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Respectfully submitted,

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Encls.

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